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# Blight Fight

Researchers Are Trying To Develop A Disease-Resistant Chestnut Tree

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MICHAEL KODAS, July 11, 2007

LEILA PINCHOT, a student in the Yale School of Forestry, is working with the American Chestnut Foundation to gather pollen from American chestnut trees, which have been decimated by a blight. She hopes to cross-pollinate the trees with Chinese chestnut trees to produce a blight-resistant strain.

By STEVE GRANT | Courant Staff Writer  
July 11, 2007

This was painstaking, time-consuming work, low-tech but high-promise.

Leila Pinchot, a graduate student with a forestry pedigree few can match, stood atop a stepladder beside an American chestnut tree near the green in Tolland, snipping a leaf here, a leaf there, removing catkins.

The idea was to cover and protect this tree's still immature flowers for a week or two, until they could be hand-fertilized with pollen from hybrid chestnut trees resistant to a blight that all but eliminated the American chestnut from forests in the Eastern United States during the first half of the 20th century.

For hours she worked, covering dozens of chestnut blooms with paper bags.

The tree she worked on is one of a handful of Connecticut chestnuts identified so far that survived the blight and still produces some flowers. It is a sickly tree, hardly a noble specimen, but it has enormous value as a repository of genetic information.

Working with that native tree and others like it, Pinchot, along with the American Chestnut Foundation and the Connecticut Agricultural Experiment Station, hope in coming decades to repopulate Connecticut with a species that was the single most important in Connecticut hardwood forests a century ago.

Important is almost an understatement when describing the chestnut in Connecticut.

"In 1910, when chestnut blight disease started killing our chestnut trees, half of the standing timber was chestnut and

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Even as she works with chestnuts around the state, Leila Pinchot is pursuing a master's degree in forestry at the school her great-grandfather helped found. That she could see the day when nearly pure American chestnuts again regenerate in Eastern forests nicely brackets the heretofore sad story of the chestnut; her great-grandfather a century ago witnessed the first years of the blight's destruction, helpless to do anything as trees died by the tens of thousands.

"At that point, people didn't know what to do," she said.

"It was a huge part of the forest here, just huge. When the blight came in, it was just devastating, especially for the wildlife populations because they depended on the chestnuts as an annual crop."

The American chestnut, native to the Eastern United States, produced tasty nuts eaten by wildlife and humans, and its wood, strong and rot-resistant, was commonly used for utility poles, barn rafters and many other applications. It grew tall and straight, often towering over other trees in the forest.

But in 1904 the blight, an Asian fungus, was discovered on trees in New York City. By mid-20th century, the blight had essentially destroyed chestnuts throughout the tree's range. All that remain are comparatively small and almost-always sickly trees that sprout from old root systems. Still, the genetic makeup of those trees, adapted over the centuries to Connecticut conditions, is priceless.

Through state chapters, the chestnut foundation emphasizes restoration work that relies fundamentally upon those local trees so that the end-product resistant tree in each state will be adapted to the local climate.

What Pinchot does is first isolate the chestnut flowers in late June or early July. Shortly after, those flowers are pollinated with pollen from hybrid trees with blight resistance. When the nuts are produced in the fall, they are harvested and planted. When the trees emerge, they are selected for disease resistance and American chestnut traits. To produce a tree that is almost entirely American chestnut, but with Chinese resistance, should take six generations.

The American Chestnut Foundation already has trees in the South that are almost entirely American chestnut, as does the experiment station here in Connecticut. Breeding work by the foundation's Connecticut chapter began in Connecticut in 2005, building on the work already in progress here.

Why not just grow Chinese chestnuts? "They have poor timber form," Pinchot said. "They are short and they can't compete well in Eastern deciduous forests." In short, all the researchers want out of the Chinese chestnut is its resistance to blight.

Blight-resistant Connecticut chestnut trees are still some time off, with another two generations of backcrossing still to come once this year's nuts are planted.

"We will probably have resistant nuts in 10 to 15 years," Pinchot said. "These will be locally adapted Connecticut chestnuts, which is the whole point of having the state chapters, to get locally adapted trees."

The foundation work is promising and seems to be making progress, but a successful outcome is not yet assured, said Graeme P. Berlyn, the E. H. Harriman Professor of Forest Management at the Yale forestry school. "I don't want to be the bad guy," he said. "I wish them all the luck in the world. It is a difficult problem."

stnut trees in the state," according to Sandra L. Anagnostakis, a scientist at the Connecticut Agricultural Experiment Station and one of the nation's pre-eminent chestnut restoration researchers.

Connecticut has a long history in chestnut restoration. In 1930, Arthur Graves, another Connecticut scientist, began the work that continues to this day, crossing blight-resistant Asian chestnuts with American chestnuts on property in Hamden. Anagnostakis herself has been working with chestnuts since the 1960s.

Pinchot, the foundation's New England regional science coordinator, adds to chestnut restoration one of the great names in American forestry. She is the great-granddaughter of Gifford Pinchot, a Simsbury native who co-founded what is now the Yale School of Forestry and Environmental Studies, was the first head of the U. S. Forest Service and a towering early figure in American conservation. He is even credited with coining the use of the word conservation in the context of natural

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The foundation work plays off the effort led by Anagnostakis, who is placing hybrid, disease-resistant American chestnuts in parts of the state where there are sufficient American chestnut sprouts. Using a biological control, Anagnostakis coaxes the native sprouts to stay alive long enough to flower and naturally cross with the planted hybrids, which have been selected for American chestnut traits.

Stands of these hybrids have recently been planted in the Farmington Town Forest and at the James L. Goodwin State Forest in Chaplin and Hampton.

As biology goes, it is not the high-tech molecular biology that gets so much attention today, but it is making progress.

"This is the way real science starts," Anagnostakis said. "People can talk about DNA all they want. But you have to have the biology first."

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